

Title (en)  
A STREAMING COMPILER FOR AUTOMATIC ADJOINT DIFFERENTIATION

Title (de)  
STREAMING-COMPILER ZUR AUTOMATISCHEN ADJUNGIERTEN DIFFERENZIERUNG

Title (fr)  
COMPILATEUR DE DIFFUSION EN CONTINU POUR LA DIFFÉRENCIATION AUTOMATIQUE DES AJOUTS

Publication  
**EP 3764249 A1 20210113 (EN)**

Application  
**EP 19185052 A 20190708**

Priority  
EP 19185052 A 20190708

Abstract (en)  
A method for operating on a target function to provide computer code instructions configured to implement automatic adjoint differentiation of the target function. The method comprises: determining, based on the target function, a linearized computational map (100), LCM, of the target function wherein each node of the LCM (100) comprises an elementary operation; for each node of the LCM (100) forming computer code instructions configured to: (i) compute intermediate data associated with a forward function of an automatic adjoint differentiation algorithm; and, (ii) increment, according to the automatic adjoint differentiation algorithm, adjoint variables of the preceding connected nodes of the each node in dependence on intermediate data; wherein forming computer code instructions for both step (i) and step (ii) for each node is performed prior to performing said steps for a subsequent node of the LCM (100).

IPC 8 full level  
**G06F 17/10** (2006.01); **G06F 8/30** (2018.01)

CPC (source: EP US)  
**G06F 8/443** (2013.01 - US); **G06F 8/4443** (2013.01 - EP); **G06F 17/10** (2013.01 - EP); **G06F 17/17** (2013.01 - US)

Citation (search report)  
• [I] LAURENT HASCOËT: "Automatic Differentiation by Program Transformation", 30 April 2007 (2007-04-30), XP055652372, Retrieved from the Internet <URL:https://www.sop.inria.fr/tropics/papers/supportCoursDA.pdf> [retrieved on 20191212]  
• [I] CHRISTIAN H BISCHOF ET AL: "Implementation of automatic differentiation tools", PARTIAL EVALUATION AND SEMANTICS-BASED PROGRAM MANIPULATION, ACM, 2 PENN PLAZA, SUITE 701 NEW YORK NY 10121-0701 USA, 14 January 2002 (2002-01-14), pages 98 - 107, XP058341921, ISBN: 978-1-58113-455-1, DOI: 10.1145/503032.503047  
• [I] ZAHRASADAT DASTOURI ET AL: "A MIXED OPERATOR OVERLOADING AND SOURCE TRANSFORMATION APPROACH FOR ADJOINT CFD COMPUTATION", PROCEEDINGS OF THE VII EUROPEAN CONGRESS ON COMPUTATIONAL METHODS IN APPLIED SCIENCES AND ENGINEERING (ECCOMAS CONGRESS 2016), 5 June 2016 (2016-06-05), Athens, pages 4047 - 4060, XP055653192, ISBN: 978-618-82-8440-1, DOI: 10.7712/100016.2091.11263

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Designated extension state (EPC)  
BA ME

DOCDB simple family (publication)  
**EP 3764249 A1 20210113**; EP 3997593 A1 20220518; EP 3997593 B1 20240703; EP 4290365 A2 20231213; EP 4290365 A3 20240306; US 11714618 B2 20230801; US 2022091831 A1 20220324; WO 2021005130 A1 20210114

DOCDB simple family (application)  
**EP 19185052 A 20190708**; EP 2020069307 W 20200708; EP 20750173 A 20200708; EP 23205514 A 20200708; US 202017419971 A 20200708